Queensland.

DEPARTMENT OF MINES.

GEOLOGICAL SURVEY OF QUEENSLAND

Geological Survey of Queensland.

(B. DUNSTAN, CHIEF GOVERNMENT GEOLOGIST.)

PUBLICATION No. 260.

Descriptions of Some Queensland Palaeozoic and Mesozoic Fossils.

By R. ETHERIDGE, Junr.,

CURATOR OF THE AUSTRALIAN MUSEUM, SYDNEY.

With 4 Plates.

1. Queensland Lower Cretaceous Crustacea.
2. Additional Evidence of the Largest Australian Permo-Carboniferous Trilobite.
3. A Remarkable Univalve from the Devonian Limestone, Burdekin.
4. Vetofistula, a new form of Palæozoic Polyzoa, Reid's Gap.

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Description of Some Queensland Palaeozoic and Mesozoic Fossils.

1. QUEENSLAND LOWER CRETACEOUS CRUSTACEA.

In 1892 Dr. Henry Woodward, late Keeper of the Department of Geology at the British Museum (Natural History) described a Brachyurus Decopod from the Lower Cretaceous of Queensland as *Prosopon etheridgei*,[1] and to his description I added a short appendix giving an account of what I then knew of Crustacea from the geographical area and geological formation in question.[2] Since then the only other occurrence within my recollection is that of a Macruran carapace described as *Enoploclytia terra-reginæ*.[3] The type of the first of these Crustacea is in the Queensland Museum, and although without precise locality, it is manifestly from some spot within the Central Queensland Cretaceous area.

This occurrence is abundantly confirmed by a series of specimens lately received for description from Mr. B. Dunstan, Chief Government Geologist, obtained at Beaconsfield, near Longreach, and by an additional example in the Australian Museum.

With the *Prosopon* forwarded by Mr. Dunstan are two examples of a *Hoploparia*, and possibly a *Glyphea* from the Maryborough Marine Series of the Cretaceous at the Kolan River, Wide Bay District.

I am further indebted to Mr. A. B. Walkom, of the Department of Geology, University of Queensland, for several examples of a Macruran from the Cretaceous beds on Woody Island, which will be referred to in the sequel.

Beaconsfield Brachyura.

Genus PROSOPON, *Von Meyer*, 1835.

(Jahrb. für Min., 1835, p. 329.)

Prosopon etheridgei, *H. Woodward.*

(Pl. 1, figs. 1-4.)

P. Etheridgei, H. Woodw., Proc. Linn. Soc. N.S. Wales, vii. (2), pt. ii., 1892, p. 301, pl. IV.

Obs.—There are eight examples of this "man-faced" Crab, two of these being specimens with their matrix cast cavities. In the already figured specimen the anterior portion of the abdominal

[1] Woodward—Proc. Linn. Soc. N.S. Wales, vii. (2), pt. i., p. 301, pl. iv.

[2] Etheridge—*Ibid.*, p. 305.

[3] Etheridge—Rec. Austr. Mus., x., No. 9, 1914, p. 271, pls. xxiii. and xxiv.

somites was revealed, but in those supplied by Mr. Dunstan portions of the ambulatory limbs are exposed. So far, however, as completeness is concerned, the single specimen in the Australian Museum is the more so in itself. Dr. Woodward's description is so ample and precise that little is left for me to refer to but the presence of the ambulatory limbs, which are displayed, more or less, in three of the Beaconsfield examples as well as in our Museum specimen.

In the specimen in question and on one of the Survey examples there are portions of the usual four pairs of limbs, more or less, the chelæ and three pairs of ambulatory limbs or endopodites. In the Museum example (Pl. I., fig. 1), on the right side, and on the left side of the survey specimen (Pl. 1., fig. 2), I believe the first, second, and third endopodites are preserved, but on the left side of the former there are the first, second, and fourth, the third missing just as the fourth is on the right-hand side.

Of the first and second endopodites on the right side of the Museum fossil (Pl. 1, fig. 1) there can be no doubt. If the positions of these limbs be compared with those of *Dorippe*, the recent ally of *Prosopon*, it will be seen that the third appendage (Pl. 1, fig. 1) in passing below for its abdominal attachment occupies the correct position of the third endopodite. On turning attention to the left side of the same fossil, we find the third leg wanting and the fourth present, occupying precisely the same position as the corresponding limb does in *Dorippe*, *i.e.*, perched on the upper anterior surface of the abdomen (Pl. 1, figs. 1 and 2), immediately behind the posterior margin of the carapace.

In the genus *Dorippe* the last two pairs of legs are "raised on the upper surface of the body behind the carapace"; they are thus "adapted for carrying foreign bodies to serve as a protection."

The podomeres of the endopodites (Pl. 1, fig. 1) are crenulated and granuled along their respective edges. On one specimen the six abdominal somites and telson are partially preserved (Pl. 1, fig. 4).

The rostrum was not greatly produced, and is obtusely rounded at the apex. Portions of the eye-stalks are visible in three specimens (Pl. 1, figs. 1 and 2).

Dr. Woodward entered very fully into a comparison of this Queensland Crab, with other previously known forms of *Prosopon*,

particularly those described by Prof. A. Reuss from the Neocomian, and by Dr. H. von Meyer from the White Jura, &c. The nearest ally it appears to me is *P. verrucosum;* Reuss,[4] Neocomian in age.

Beaconsfield Macrura.

Genus HOPLOPARIA, McCoy, 1849.

(Ann. Mag. Nat. Hist., iv. (2), 1849, p. 175.)

Obs.—Accompanying the examples of *Prosopon* are portion of a carapace, and six abdominal somites of another specimen, which from their association in the same deposit, and at the same locality, I assume to be of like identity. At first I took these to be *Enoploclytia,* but on further examination the carapace revealed features allying it very closely with *Hoploparia,* McCoy, more particularly in the presence of what McCoy termed a "deep λ-shaped sulcus."

Hoploparia mesembria,[5] *sp. nov.*

(Pl. 1, fig. 5; ? Pl. 2, fig. 1.)

Obs.—About one-half a carapace is preserved; the anterior rostral portion and extreme posterior are missing. The nuchal furrow is deep and broad dorsally, and, as described by McCoy, not reaching the ventral margins. The Greek λ-shaped sulcus, in advance of the nuchal furrow, is exceedingly well-marked, and its ventral bifurcation semi-encloses a well defined tubercle. The anterior branch of this characteristic sulcus runs as far forward, almost horizontally, as the carapace is preserved; the posterior branch is soon lost on the carapaceal surface. On the gastro-hepatic region are two depressed prominences or tubercles. The entire carapace is densely granuled.

There is a strong resemblance between this *Hoploparia* and *H. biserialis,* Fritsch,[6] from the Chalk of Bohemia.

The specimen (Pl. 2, fig. 1) associated with this carapace consists of five abdominal somites and portion of the sixth, each well rounded above, so presenting a strong and rather broad back. The pleuræ appear to be all pointed, with entire margins; they may be described as broadly triangular, not acutely so, as in *Enoploclytia.* Assuming this to be the abdomen of the associated carapace, *H. mesembria* must have attained a length of at least eight inches.

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[4] Reuss—Denksch. K. Akad. Wiss. Wien, xvii. 1 abth., p, 70, pl. xxiv., fig. 1.

[5] μεσημβρια South.

[6] Fritsch and Kafka—Crustaceen Böhm. Kreidef., 1887, p. 36, fig. 56.

Woody Island Macruran.

Genus GLYPHEA, *von Meyer*, 1835.

(Jahrb. für Min., 1835, p. 328.)

Obs.—On the fractured surfaces of a series of blue-black calcareous nodules are fragmentary portions of a Macruran. Of these, only two and their counterparts and a third impression are sufficiently decipherable for description—one is the larger portion of a carapace, the other a similar but smaller specimen with the remains of abdominal somites, and traces of appendages. I am indebted for an introduction to these to Mr. Walkom, as already explained, who has also supplied some valuable geological notes.

I refer this carapace, &c., to Von Meyer's genus *Glyphea* from the presence of a deeply impressed V-shaped nuchal furrow, and the characteristic oblique branchial furrows, meeting one another on the back from opposite sides at an acute angle, without reaching the posterior margin, a character which McCoy says distinguishes *Glyphea* from *Meyeria*, McCoy.[7]

Glyphea arborinsularis, *sp. nov.*

(Pl. 1, fig. 6; Pl. 2, figs. 2 and 3.)

Obs.—The carapace is much compressed laterally, generally oval in outline, the anterior rostral portion subtriangular and bearing two, perhaps three, strong longitudinal carinæ. The muchal furrow is deep, strong, and slightly curved sigmoidally. The cervical groove branches cut the dorsal line, or back, at about one-third from the carapace posterior margin passing obliquely (as usual) across to within about one-fourth from the nuchal groove, when they are suddenly reflected to the ventral margins with a slight posterior inclination. The surface of the carapace halves between the nuchal and branchial furrows is divided into three, or perhaps four, sub-areas, as follows :—The nuchal furrow is succeeded posteriorly by an area, best described as "leg of mutton-shaped," the lower part of which rises into an obtuse granulated tubercle; behind this area and above the branchial groove is the largest sub-area, irregularly triangular in outline; below the sub-area first mentioned is the smallest, transversely elongate, and extending to immediately under the postero-ventral points of the rostrum. The whole carapace is densely granulated, including the rostral carinæ; the granules are largest and sparsest on the two dorsal sub-areas, smaller and densely packed on the large general areas below and behind the branchial grooves.

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[7] McCoy—Ann. Mag. Nat. Hist., iv. (2), 1849, p. 334.

The second specimen (Pl. 2, fig. 3), as already explained, consists of a small portion of another carapace, the six abdominal somites ill-preserved, certainly one of the exopodites of the last pair of pleopoda, and fragments of the larger limbs showing very faint traces of granulation. The abdominal segments attain a length of about three inches; beyond these facts little more can be made of these remains.

The third example is an impression of a carapace posterior to the nuchal furrow (Pl. 1, fig. 6.)

Mr. Walkom has afforded me the following geological notes:—The horizon of these Crustacea on Woody Island is 600 to 650 feet below the freshwater measures of the Burrum Series. The succession as given by Mr. Dunstan is as follows:—

1,700 ft.	Freshwater beds = Burrum Series.
500 ft.	Marine beds.
50 ft.	Freshwater beds.
200 ft.	Marine beds.

The 50 ft. "freshwater" beds are in all probability marine. The grey calcareous nodules containing these prawn remains occur in the bottom 200 ft. Marine beds. A number of other fossils are said to be also abundant in this stratum, the chief being *Fissilunula clarkei*, *Crioceras australe*[8], *Belemnites canhami*, and a large *Maccoyella*.

Locality:—Woody Island, Great Sandy Strait, midway between Fraser Island and Urangan.

Amongst the specimens from the Geological Survey is a hand example of blue-grey non-calcareous mudstone with the remains of a large Prawn-like Crustacean from the Maryborough Series of the Kolan River.

There are preserved—(*a*) Apparently certain of the thoracic structures within the cephalic-thoracic flap, or gill cover, which has disappeared; (*b*) possibly three abdominal somites; (*c*) one of the chelæ, with its terminal very finely toothed podomere displaced; (*d*) portions of two of the ambulatory endopodites, and perhaps an indication of a third behind them; (*e*) protruding forwards in advance of all is probably the remains of one of the antennæ.

The endopodites of the chela are freely granulated, but the granules do not appear to ornament longitudinal carinæ; on the contrary they are scattered, except the presence of a definite marginal row along the anterior edges of the podomeres, and cross rows at the podomere sutures.

[8] Now an abandoned name.

In the absence of the carapace it is impossible to generically name this Crustacean, but there is every possibility of it proving to be *Glyphea arborinsularis.*

Locality :—Bucca Crossing, Kolan River, Wide Bay District.

Horizon :—Maryborough Marine Cretaceous Series.

Collection :—Queensland Geological Survey (Spec. F. 907).

Genus CALLIANASSA, *Leach*, 1813.

(Brewster's Edinb. Encycl., vii., 1813.)[9]

Callianassa (?), sp.

(Pl. 2., fig. 4.)

Obs.—In the "Note on Queensland Crustacea," already referred to, I spoke of a chela of a Macruran from the Queensland Museum Collection, possibly one of the Astacomorpha or Thalassinidæ.

It consists of either the fourth and third podomeres, or even perhaps the second (in part), and third and fourth of one of the chelipids.

Locality :—Walsh River or Mitchell River ? In blue argillaceous limestone.

Horizon :—Rolling Downs Series, Lower Cretaceous.

Collection :—Queensland Museum, Brisbane (Spec. F. 17, 1280).

[9] *Vide* L. Agassiz.—Nomenclator Zoologicus.

2. ADDITIONAL EVIDENCE OF THE LARGEST AUSTRALIAN PERMO - CARBONIFEROUS TRILOBITE (PHILLIPSIA GRANDIS).

(Plate 3, fig. 3.)

The further evidence of this Trilobite consists of the impression of a large pygidium, small portion of the thorax, and incomplete cephalon in relief, but all devoid of test. The cephalon is seen from the ventral side, and is revealed to the extent of about one-half, exposing portion of a large free cheek, apparently obtusely rounded genal angles, a very wide limb sculptured with strong concentric lines, and possibly an indication of a second free cheek; near the centre is the subfusiform impression of the central portion of the hypostome with anastomosing ornament. The free cheek as seen from the lower or ventral side is pitted, which probably implies that the upper, or dorsal, surface would be minutely granular. This cephalon as preserved is 30 mm. long, and the breadth, were the specimen complete, would be about 60 mm., revealing a very large head shield indeed, for a Carboniferous or Permo-Carboniferous Trilobite.

The thoracic portion consists of small parts of the axis and three pleuræ of the axis. Beyond showing that it possessed facets for rolling-up, little more can be said. The not quite-perfect pygidium measures 35 mm. long by 30 mm. wide. It is semi-oval, with both the axis and pleuræ fairly convex, the former tapering slowly. There are sixteen or seventeen segments or somites, and on the pleuræ fifteen. Neither the axis nor the side lobes have any special characters, except that the surface is freely and minutely granulate. The distal ends of the pleural divisions do not reach the pygidial margin but fade off into a narrow free limb, with a slightly thickened margin; the axial grooves are well marked and deep. On the uncrushed side the pleura surface slopes gently and evenly down to the limb without describing an abrupt declivity.

These are the remains of the largest Carboniferous or Permo-Carboniferous Trilobite of which I have any knowledge. Unfortunately, there is very little to go on for generic determination in

the absence of a complete cephalon, or at any rate glabella. Two genera in particular put in a claim for recognition—*Phillipsia* and *Griffithides*—and these can only be readily told apart by the characters of their respective glabellas. Col. J. E. Portlock, R.E., the author of the first-named genus, truly said on this point :—"As this form of pygidium recurs in another mountain limestone genus, although the corresponding forms of cephalo-thorax are strikingly different, the genus cannot be satisfactorily determined from a specimen of the pygidium alone."[1]

The Proetidæ, to which family the above genera belong, is represented in Carboniferous rocks by four principal genera—*Proetus* itself, *Phillipsia*, *Griffithides*, and *Brachymetopus*. The last may be dismissed without further comment ; *Proetus* the present remains can hardly be from the outline of the pygidium, and the large number of segments ; of the remaining two genera, in which the pygidium is practically the same, I provisionally select *Phillipsia*, and refer this fine representative of the Carboniferous Trilobites to the already described *P. grandis*, Mihi.

All three genera, omitting *Proetus*, are found in Australia, but so far those discovered are, with one exception, small forms and quite unfitted for comparison with *P. grandis*. Two occurrences of this are on record,[2] the original one by Mr. D. A. Porter, near Carrol, Co. Buckland, New South Wales, and a subsequent find by Mr. C. S. Wilkinson at Crow's Nest, near Mount Morgan.

Locality :—Crow's Nest, near Mount Morgan.

Horizon :—Gympie Series, Permo-Carboniferous.

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[1] Portlock—Geological Report Londonderry, &c., 1843, p. 306.

[2] Etheridge—Mem. Geol. Survey N.S. Wales, Pal. No. 5, 1892, p. 128, fig. 5, and pl. xxi. fig. 5.

3. A REMARKABLE UNIVALVE FROM THE DEVONIAN LIMESTONE OF THE BURDEKIN RIVER, QUEENSLAND.

(Plate 3, figs. 1 and 2.)

It is now many years since this shell first came under my notice. It was sent to me by Dr. R. L. Jack in 1896, during his tenure of office as Government Geologist of Queensland, and has since remained amongst the "undetermined," simply from my inability to assign it a satisfactory systematic position. The shell was collected by Mr. George Cooper and presented to the Queensland Geological Survey Collection. At my request Mr. Dunstan some time ago returned the fossil to me for further study.

The imperfect condition of this remarkable petrefaction is regrettable. We are left in ignorance of the structure of the base, the presence or absence of an umbilicus, and in a great measure of the outline of the aperture, also. Notwithstanding these imperfections, its structure, even as preserved to us, is sufficiently marked to warrant close study.

The shell is low conical, or broadly and briefly sub-turrited, of about five whorls, with a short and apparently somewhat flattened spire. The conversion of the whole test into crystalline calcite has rendered the structural details of the upper whorls obscure The body-whorl is sloping and slightly concave above, from the suture to the periphery, but from the latter to the edge of the base feebly rounded or gently convex; the surface of the antepenultimate whorl appears to be similar to that of the penultimate as just described. Around the sutures of both whorls are a series of large, disconnected, upstanding tubercles, or, possibly, tubular openings, in all sixteen so far preserved. A similar series exists along the periphery, or shoulder, of the body-whorl, eighteen in number. On the gently convex side of the body-whorl are four equidistant encircling lines of blunt prominences gradually lessening in size forwards, the fourth or lowest circle forming the edge of the base. The aperture is not sufficiently well preserved to define the peristome, but the general appearance of the fossil leads me to believe it was more or less transversely oval.

The whole of the sculpture has been destroyed by the calcite conversion of the testiferous tissue. It is, therefore, impossible to say whether the lines of growth were, or were not, sufficiently deflected to give rise to a shallow indentation, or notch, on the outer lip; as in some Euomphalidæ. Similarly, there is no trace of the slit-band, or anal-fasciole of the Pleurotomariidæ, or the same represented by one or more peripheral perforations; I can only conclude, therefore, the aperture was entire. The calcite replacement again interferes with the solution of the precise nature of the series of very pronounced tubercles, were they merely tubercles or short spinous processes, or were they hollow channels or tubes?

In the absence of the apertural and umbilical characters it is impossible to surmise of this shell's generic affinity with certainty. This is the more tantalising because it is unquestionably new to Australian Palæontology.

It is clearly not a member of the Pleurotomariidæ; the absence of any trace of a slit-band indicates this. There is a small Canadian Silurian shell worthy of notice, described by Mr. J. W. Salter as *Helicotoma* (?) *spinosa*,[1] in which the spire was depressed but slightly turrited. Along the sutures are a series of nodes arranged precisely as in the Burdekin fossil, and strongest around the periphery of the body-whorl. This is manifestly not a *Helicotoma* in the strict sense of the word, as practically admitted by Salter, who accounted for the tubercles by supposing them to be the "relics of a papillate sponge, converted into silex, and having its projecting portions determined in position by the ridges of the shell." This explanation, however, will not account for the extreme regularity of these tubercles; they appear to me to be natural outgrowths of the test, as in the present instance. Salter's remarks on the "projecting portions" are so descriptive of broken tubes in our shell as to be worthy of quotation. "The upper surface is thickly studded over with tubercles, which are disposed in sub-concentric rows, one row of large compressed crest-like tubercles along the outer carina, an imperfect row within this on the upper concave surface, and several incomplete rows of smaller size on the outer convex edge."[2] It is difficult to say to what genus Salter's species should be referred, but so far as the characters of the posterior (or upper) surface are

[1] Salter—Canadian Organic Remains, i., 1859, pl. ii., figs. 9 and 10.

[2] Salter—*Ibid.*, p. 15.

exhibited there is a close approximation between the Canadian and Burdekin species.

There is a genus, *Cœlocentrus*, Zittel,[3] placed by Dr. E. Koken in his family of the Delphinulidæ,[4] proposed for the reception of the Devonian *Evomphalus goldfussi*, D'Archiac and De Verneuil, and the Triassic *Cirrus polythalmus*, Laube. On this union Koken remarked as follows[5]:—"But these two species are more sharply divided than one would conclude from the establishment of the genus, and should not be united under a single generic name. Since a genus *Omphalocirrus* already exists for the reception of species like *E. goldfussi*, there remains but *Cirrus polythalmus* as the content of the genus *Cœlocentrus*, we must regard it as the type species." The genus *Omphalocirrus* may be at once dismissed as it bears no further reference to the present inquiry.

I regret I have not access to either a description or figure of the *Cœlocentrus* type, but if it resembles either *C. heros*, Koken,[6] or *C. moellendorfi*, Lóczy[7], I am quite in accord with Koken's restriction.

Furthermore, allowing as I have already premised, for whatever features may be subsequently revealed by the perfect base of the Burdekin univalve, I have succeeded in disinterring only four shells having any features in common with the Queensland species. Of these, the little *Helicotoma*, whatever it may be, has already been referred to.

The *Cœlocentri* are high turrited shells, with strongly angular whorls, quadrangular aperture, an umbilicus, and around the body-whorl periphery are long projecting tubular extensions (*C. heros*), or knot-like growths in a similar position (*C. moellendorfi*). The fourth shell Koken drew attention to in the following words[8]:—"A Silurian form which much resembles the Triassic forms is *Pleurotomaria elora*, Billings (Guelph Formation), of which Whiteaves

[3] Zittel—Handb. Pal., 1 Abth., ii., 6 lief. 1882, p. 206.

[4] By others *Delphinula* and its allies are placed in the Trochidæ.

[5] Koken—Jahrb. K. K. Geol. Reichsanst. Wien, xlvi., 1, 1896, p. 95.

[6] Koken—*Ibid.*, p. 95, fig. 18.

[7] Frech—Roemer's Lethaea Geognostica, ii. theil-Mesozoicum, i., 1 lief, 1903, p. 97, fig. 3; 2 lief., pl. 30, figs. 6a-d.

[8] Koken—*Loc. cit.*, p. 95.

has recently given a good figure." According to Whiteaves[9] "the angulated periphery of the outer volution, when perfect, is armed with a single row of long, and slightly curved, slender and hollow spines, not unlike externally to those of *Guildfordia* or some recent species of *Astralium*[10] . . . the spines appear to commence on the outer half of the last volution of the spine, where they form a spiral row of small tubercles immediately above that part of the suture which separates the spire from the outer volution."

It is to be regretted Whiteaves did not give a view of this shell in elevation to show the outline of the antepenultimate and upper whorls, because on referring to Billings' original description[11] and figure, which Whiteaves says is that of an internal cast, the latter is that of a dumpy conical shell with regular, straight, whorl-sides.

Although there are points of correspondence between all these shells, much study and comparison will be required before Billings' Silurian shell can be satisfactorily said to be one of the *Cœlocentri*, and as to the subject of the present notice, no definite conclusion of its systematic position can be arrived at pending the discovery of a specimen displaying the aperture and base, in the meantime I propose to call this Queensland univalve *Polyamma*[12] *burdekinensis*.

In conclusion, a word on the generic name *Cœlocentrus*. So far as I can gather, this was suggested by Zittel about 1882, but previous to that Crosse and Fisher had, in 1872, proposed *Cœlocentrum*.[13] If the latter stands, the former must pass out, in which case I propose to take its place *Polycnaulus*,[14] in allusion to the long closed channel-like tubes.

[9] Whiteaves—Pal. Foss. Canada, iii., pt. ii., 1895, p. 74, pl. xi., figs. 5 and 6.

[10] Both members of the Turbinidæ.

[11] Billings—Pal. Foss. Canada, i., 1865, p. 154, fig. 135.

[12] πολυς=many, αμμα=a knot.

[13] Von Martens—Zool. Record, ix., 1872 (1874), p. 157.

[14] πολυς=many, κναυλος=a hollow channel.

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4. "VETOFISTULA," A NEW FORM OF PALÆOZOIC POLYZOA, ALLIED TO "RHABDOMESON," YOUNG AND YOUNG, FROM REID'S GAP, NEAR TOWNSVILLE.

(Plate 4.)

In three genera, at least, of ramose and possibly shrub-like small Palæozoic Polyzoa, each branch is provided with a central longitudinal canal, or tube. These are *Rhabdomeson*, Young and Young, *Cheilotrypa*, Ulrich, and *Urceopora*, Eichwald, the first Carboniferous, the second both Carboniferous and Upper Silurian (Niagara Formation), and the third from the Silurian of the Baltic Provinces.

I have had by me for some years past most interesting specimens from the Devonian of Reid's Gap, provided with a similar axial tube; for an opportunity to study these I am indebted to Mr. George Sweet, of Brunswick, Melbourne.

The fragmentary branches scattered over the surface of a piece of limestone exhibit very distinct longitudinal central canals, and so far are clearly related to one or other of the beforementioned genera. I was at first led, before the preparation of sections for the microscope, by the form of the zoœcial apertures to regard these polyzoaria as allied to *Alveolites*. The mode of increase was by bifurcation, without any indication of the union between the bifurcates; the diameter varies from two to four millimetres, the length of the longest branch seen being thirty millimetres. The zoœcia are superficially arranged in oblique lines resulting in a roughly quincuncial arrangement, two apertures in the space of one millimetre lineal. The zoœcial apertures are longitudinally elongated, v-shaped, the lower margins prominent, lip-like; on the inner walls of each can be distinguished with an ordinary pocket lens a longitudinal ridge, similar to the septal ridges in *Cœnites*, and some *Alveolites*.

In a transverse section the axial canal or tube is always visible, surrounded by one or two cycles, as the case may be, of zoœcial tubes separated by moderately wide, opaque, homogeneous stereoplasmic tissue, entirely devoid of any appearance of vesicular tissue, but in which the primordial walls are still visible (Pl. 4, figs. 3 and 4). These show that the tubes were originally polygonal, but now sufficiently thickened by the deposition of stereoplasma to have lost all geometrical outline, which may be either round, oval, or irregular, and with a variable diameter.

It is, however, in a longitudinal section (Pl. 4, figs 1 and 2), we obtain the clearest insight into the structure of this interesting fossil. The axial tube is always very apparent, remarkably persistent, about half a millimetre in diameter, with a well-defined primordial wall, strengthened by a stereoplasmic lining. There does not appear to be any trace of pores of communication between it and other parts of the zoarium, but I believe I can distinguish distantly spaced tabulæ.

The zoœcial tubes are long, the angle of curvature from the axial to the peripheral portion an obtuse or open one, consequently the curve is at a very gradual inclination. The axial portions far exceed the peripheral in length, and lie nearly parallel to the axial canal. The interstitial spaces are thick and dense, arising from the copious stereoplasmic deposit, but the primordial walls are usually discernible as dark lines; there is not the slightest trace of any cellular or vesicular structure in the thickened walls.

In *Rhabdomeson* the zoœcial apertures, placed a little below the general surface of the zoarium, open each into an outer chamber, or "vestibule," but in *Vetofistula* I have failed to detect such chambers, the tubular zoœcia merely contracting to form somewhat compressed openings, with lower v-shaped margins; nor are there any "solid rods," or acanthopores, either visible macroscopically on the surface of the zoarium, or microscopically in the stereoplasmic thickening. In the Rhabdomesontidæ, according to Dr. E. O. Ulrich[1] "hemisepta [are] usually developed," but my sections do not exhibit these structures in the slightest degree.

In *Chilotrypa*[2] the zoœcia have the posterior portion of the wall elevated hoodlike, the aperture elliptical and oblique, the interzooidal spaces vesicular, but the inter-apertural surfaces solid. These vesicles are filled with a dense calcareous deposit; the axial canal irregularly contracts and expands, and tabulæ are present. The structure of the organism I term *Vetofistula* is thus essentially different from that of *Chilotrypa*, except the common character of the zoarium being traversed by an axial canal.

In *Urceopora*, Eichwald,[3] "the cœnenchyma between the distantly spaced cellules is finely porous, the horny axis is thick and provided with a median canal." As of others of Eichwald's genera, very little appears to be known of *Urceopora*. Of the first of the two species described (*U. furcata*) it is said :—"The deeply-

[1] Ulrich—Illinois Geol. Survey Report, viii., pt. ii., 1890, p. 401.

[2] Ulrich—Journ. Cincinnati Soc. Nat. Hist., vii., No. 1, 1884, p. 49.

[3] Eichwald—Lethæa Rossica, i., 1860, p. 422.

excavated calices are sunk in an almost spongy mass [croûte]; the interstices [interzooidal spaces] are finely porous or granulose, and the thick axis is provided with a central canal." In the second species (*U. arbuscula*) the spongy mass, or "crust," exhibits hardly perceptible small pores. With the exception of the axial canal the characters assigned to *Urceopora* are too indefinite for close comparison with those of *Vetofistula*; furthermore, nothing at all of the nature of a *horny* axis existed.

A brief reference must also be made to the Cretaceous *Siphonella*, Hagenow.[4] This possesses a ramose zoarium, the component branches "penetrated lengthwise by an open tube, around which cells similar to those of Eschara are placed in regular rows forming only one layer." The figures of the three species described by Von Hagenow certainly display axial tubes or canals, but so many of these geologically later Polyzoa, *Siphonella* amongst the number, are too indifferently diagnosed (as compared with more recently described genera) to enable one to effect a close and searching comparison. On considering the affinity of *Siphonella*, and that of its ally *Vincularia*, as far as Von Hagenow's descriptions would permit, I was struck by their general external resemblance to *Rhabdomeson*. On referring to Dr. Ulrich's work I found he had to some extent dealt with the subject in the following words[5]:—"*Rhabdomesontidæ*:—This interesting family must be regarded as forerunners of the *Vinculariдæ*. Indeed the external resemblance to species of that later type is often so very striking that a real affinity between them is forcibly suggested. Minute comparisons show, however, that the differences which distinguish the groups of Palæozoic Polyzoa from their more recent representatives also prevail in this case. Namely, the zoœcia are more tubular than those of the Vinculards, while the secondary deposit which gave rise to the vestibule of the *Cryptosomata* is wanting in them. In other respects the closest agreement can be shown. . . . In *Rhabdomeson*, Y. and Y., the zoœcia are arranged round an axial tube the same as in the cretaceous Siphonella of Hagenow."

In the present instance we are dealing with a Polyzoon resembling both *Rhabdomeson* and *Chilotrypa* in the possession of an axial canal around which the zoœcia are grouped, and thence gently curve to the surface. From the first of these genera *Vetofistula* differs by the absence of vestibules and acanthopores, and from the second by the want of vesicular interstitial tissue, with a leaning towards *Cœnites* in the form of the zoœcial apertures. The definitions

[4] Hagenow—Bryozoen Maastrichter Kreidebildung (*n.d.*), p. 83.

[5] Ulrich—*Loc. cit.*, pp. 363-64.

of *Urceopora* and *Siphonella*[6] are too loose and indefinite to enable satisfactory comparisons to be made. I regard this fossil as the type of a distinct genus for which the name of *Vetofistula*[7] is proposed, with the minor appellation of *mirabilis*. *Rhabdomeson* is the type of its own family, the Rhabdomesontidæ, *Chilotrypa* is included in the Fistuliporidæ, characterised by the presence of the inter-zoidal vesicular tissue already referred to. *Vetofistula*, strictly speaking, accords with neither of these families, but of the two is more closely allied to the former. For the time being it may be sufficient to include it in the Rhabdomesontidæ, or perhaps suggest a sub-family name for its reception, the Vetofistuliporidæ.

In conclusion a word of warning is necessary. In one of the longitudinal sections a few circular pore-like perforations in the stereoplasmic thickening are visible, resembling the "pores of communication" of some Tabulate corals. I was at first misled into so regarding these apertures, but on mature reflection I think they can be explained by suggesting them to be the proximal or initial commencement of the zooidal tubes, cut transversely just previous to enlargement into the mature zooidal receptacle.

I am indebted to Mr. George Sweet, who collected the specimen, for an opportunity of describing this interesting addition to the Queensland Palæozoic fauna.

Locality :—Reid's Gap, near Townsville.

Horizon :—Middle Devonian.

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[6] The name *Siphonella*, at the time (1851) Von Hagenow wrote, was preoccupied by *Syphonella* (Macquart), Parris, 1839, as a genus of Diptera.

[7] *Vetus* = old ; *fistula* = a water pipe.

EXPLANATION OF PLATES.

PLATE 1.

PROSOPON ETHERIDGEI, *H. Woodward.*

Fig. 1.—Dorsal view of an almost complete individual, exhibiting the ambulatory limbs, the fourth of which on the left-hand side occupies the same position as the corresponding appendage does in the recent genus *Dorippe*.—Australian Museum Collection.

Fig. 2.—Matrix cast exhibiting practically the same characters as in Fig. 1.—Queensland Geological Survey Collection. (Spec. F. 910).

Fig. 3.—Dorsal surface of the crab of which Fig. 2 is the impression.—Queensland Geological Survey Collection. (Spec. F. 910*a*).

Fig. 4.—Ventral aspect of Fig. 3 showing abdominal somites and portion of telson.—Queensland Geological Survey Collection (Spec. F. 910*a*).

HOPLOPARIA MESEMBRIA, *Eth. fil.*

Fig. 5.—Portion of a carapace, right side displaying its furrows to advantage, particularly the λ-shaped sulcus in advance of the nuchal furrow.—Queensland Geological Survey Collection (Spec. 913).

GLYPHEA ARBORINSULARIS, *Eth. fil.*

Fig. 6.—Portion of a carapace, right side, exhibiting the cervical and nuchal grooves and subdivisional areas between them.—Queensland University Collection (Spec. 1315).

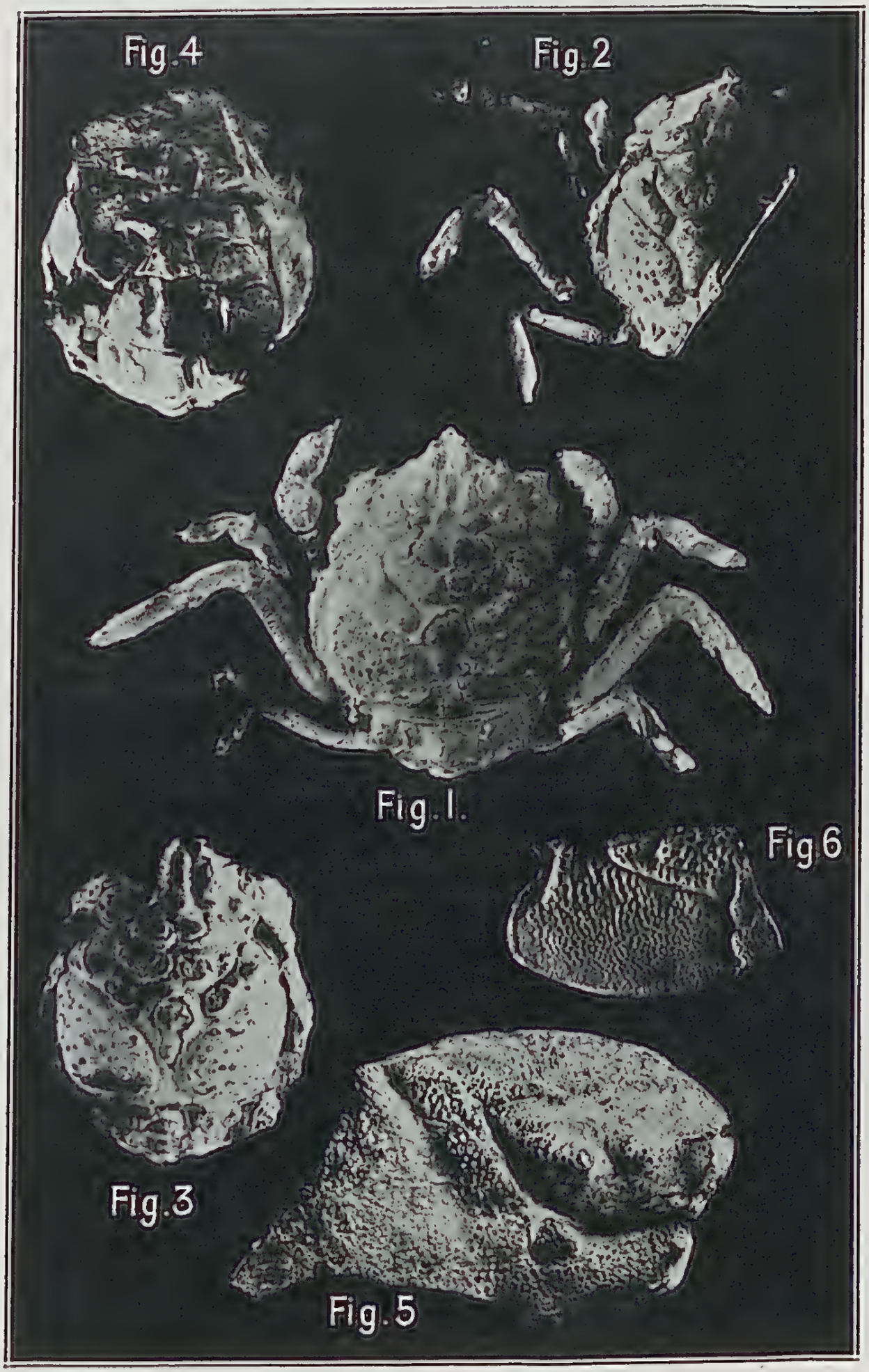
Fig. 4
Fig. 2
Fig. 1.
Fig. 6
Fig. 3
Fig. 5

PLATE 2.

HOPLOPARIA MESEMBRIA, *Eth. fil.* (?)

Fig. 1.—Five abdominal somites and portion of a sixth, occurring with the subject of Plate I., fig. 5, I assumed to be of the same species.—Queensland Geological Survey Collection (Spec. 914).

GLYPHEA ARBORINSULARIS, *Eth. fil.*

Fig. 2.—Carapace, right side, similar to Plate 1, fig. 6, with a portion of the rostrum preserved.—Queensland University Collection (Spec. 1309).

Fig. 3.—Portion of a carapace, six abdominal somites and fragments of limbs.—Queensland University Collection (Spec. 1304).

CALLIANASSA (?), sp.

Fig. 4.—Portion of chela, believed to be that of a species of this genus.—Queensland Museum Collection (Spec. F. 17, 1280).

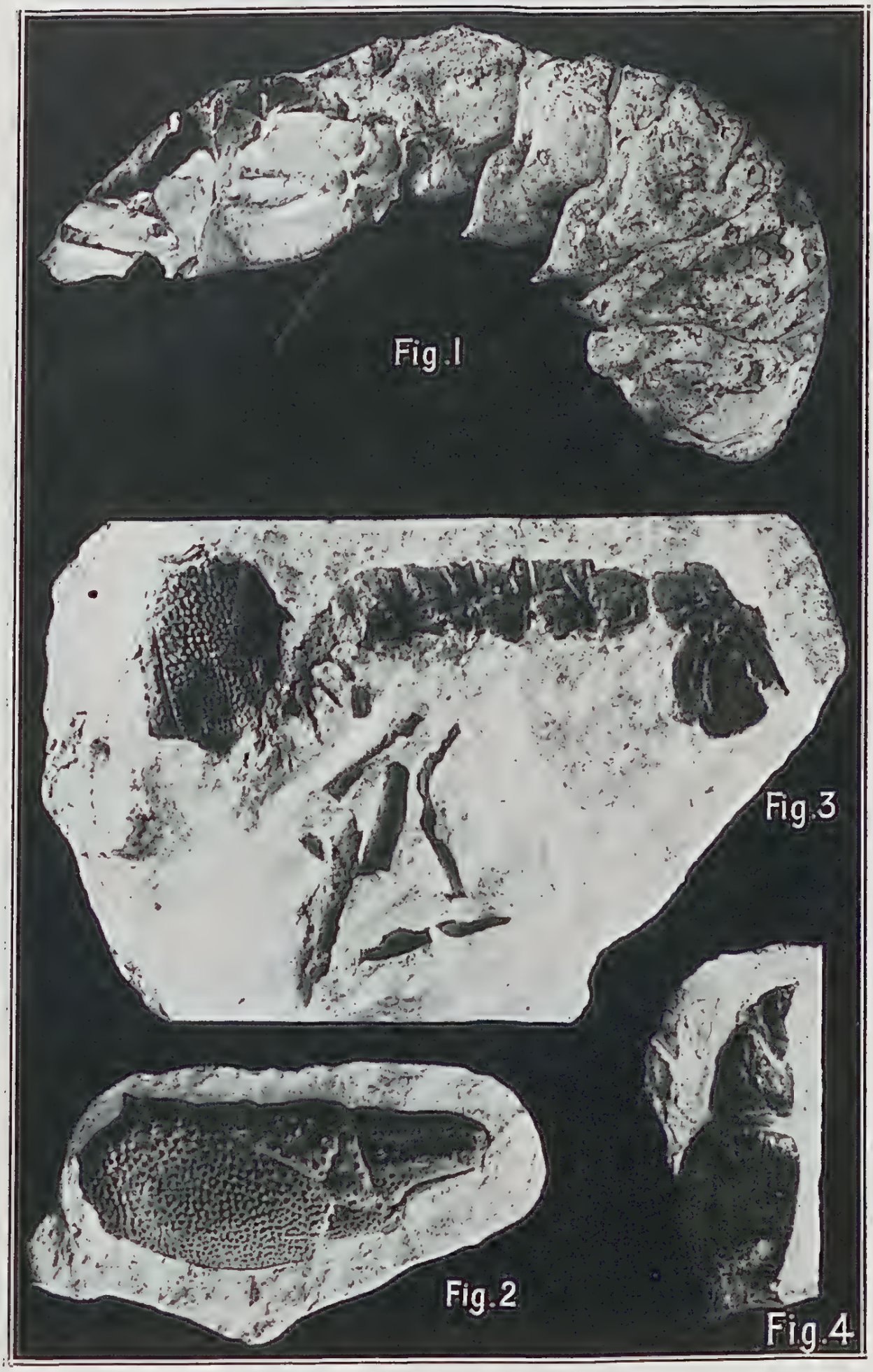
Fig. 1
Fig. 3
Fig. 2
Fig. 4

PLATE 3.

Polyamma burdekinensis, *Eth. fil.*

Fig. 1.—The shell seen from above. The large wart-like bases of the tubes are seen to extend around the periphery of the body-whorl and the suture between the latter and the antepenultimate whorl; a trifle larger than natural size.

Fig. 2.—Side view of the same, displaying the lower ranges of tubercles below the body-whorl periphery.—Queensland Geological Collection (Spec. F. 926).

Phillipsia grandis, *Eth. fil.*

Fig. 3.—On the right is the impression of the tail, or pygidium, on the left is the half of the cephalic shield, or cephalon, inverted and seen from the lower surface, with a portion of the hypostome *in situ*. In the angle between the pygidium and thorax can be seen remains of the thorax.—Queensland Geological Survey Collection (Spec. F. 927).

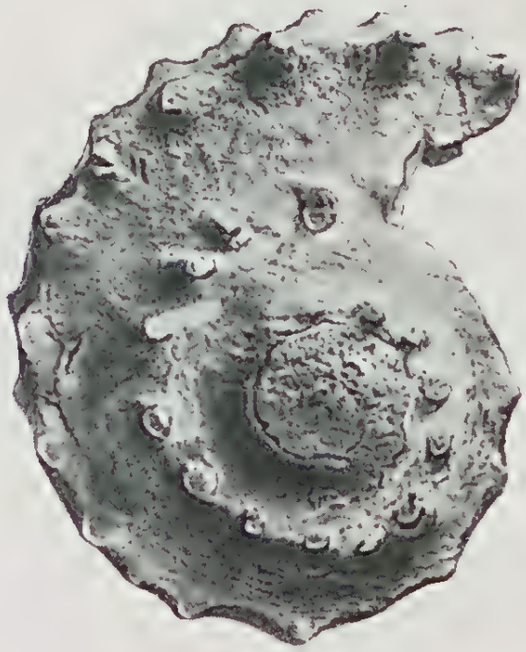

Fig. 1

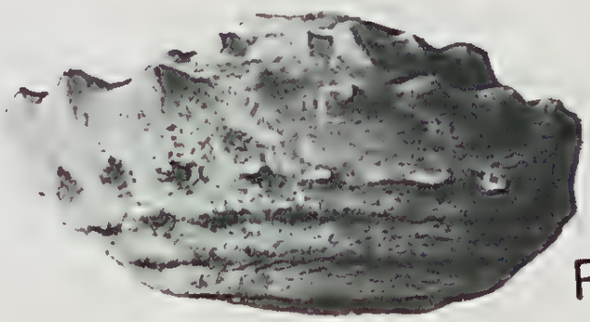

Fig. 2

Fig. 3

PLATE 4.

VETOFISTULA MIRABILIS, *Eth. fil.*

Fig. 1.—Small portion of limestone with portions of two branches weathered out in longitudinal section. × 4 diam.

Fig. 2.—The lower of the two branches more highly magnified. × 9 diam.

Fig. 3.—A similar section of a branch, displaying the axial canal, surrounded by two cycles of zooidal tubes. × 9 diam.

Fig. 4.—Transverse section of a smaller branch, in which the axial tube is seen surrounded by two to three cycles. × 10 diam.

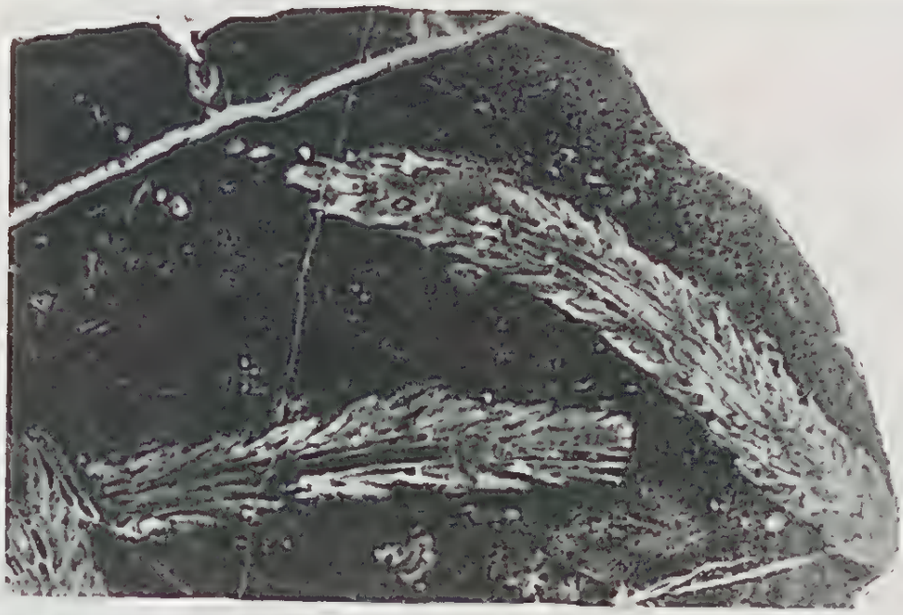

Fig. 1

Fig. 2

Fig. 3

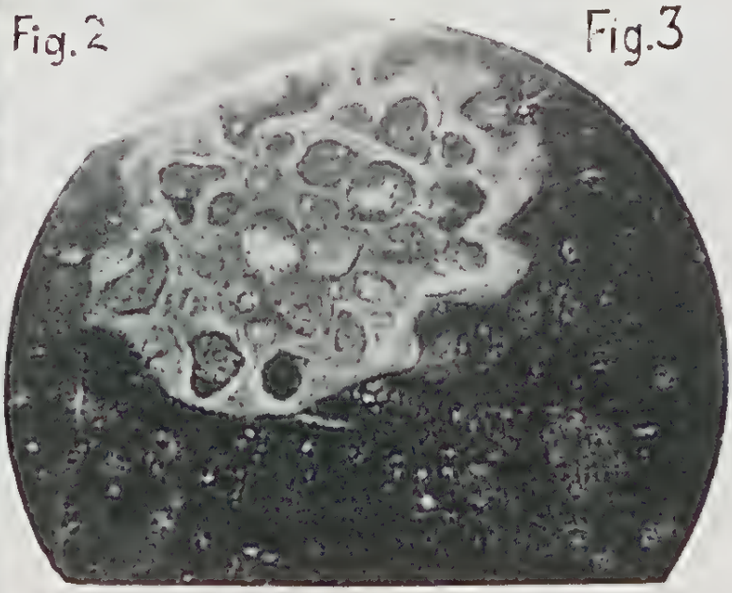

Fig 4

ANTHONY JAMES CUMMING, Government Printer, Brisbane.